THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION

GODO KAISHA IP BRIDGE 1,	§	
	§	
v.	§	CASE NO. 2:16-CV-134-JRG-RSP
	§	
BROADCOM LIMITED, BROADCOM CORPORATION, AVAGO TECHNOLOGIES, LTD., AVAGO TECHNOLOGIES U.S., INC., and LSI CORPORATION	§	

CLAIM CONSTRUCTION
MEMORANDUM AND ORDER

On October 7, 2016, the Court held a hearing to determine the proper construction of disputed claim terms in United States Patents No. 6,197,696, 6,538,324, 7,126,174, 8,354,726, RE41,980, and RE43,729. Having reviewed the arguments made by the parties at the hearing and in their claim construction briefing (Dkt. Nos. 67, 73 & 77),[1] having considered the intrinsic evidence, and having made subsidiary factual findings about the extrinsic evidence, the Court hereby issues this Claim Construction Memorandum and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015).

[1] Citations to documents (such as the parties' briefs and exhibits) in this Claim Construction Memorandum and Order refer to the page numbers of the original documents rather than the page numbers assigned by the Court's electronic docket unless otherwise indicated.

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I. BACKGROUND

Plaintiff has alleged infringement of United States Patents No. 6,197,696 ("the '696 Patent"), 6,538,324 ("the '324 Patent"), 7,126,174 ("the '174 Patent"), 8,354,726 ("the '726 Patent"), RE41,980 ("the '980 Patent"), and RE43,729 ("the '729 Patent") (collectively, the "patents-in-suit").

Below, the Court addresses the disputed terms on a patent-by-patent basis, as the parties have done in their briefing, and in the order set forth in the parties' briefing.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are set forth below within the discussion for each term.

II. LEGAL PRINCIPLES

"It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'" *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996). "In some cases, however, the district court will need to look beyond the patent's intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period." *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015) (citation omitted). "In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the 'evidentiary

underpinnings' of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal." *Id.* (citing 517 U.S. 370).

To determine the meaning of the claims, courts start by considering the intrinsic evidence. *See Phillips*, 415 F.3d at 1313; *see also C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. *See Phillips*, 415 F.3d at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time of the invention in the context of the entire patent. *Phillips*, 415 F.3d at 1312-13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Phillips*, 415 F.3d at 1314. First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314-15.

"[C]laims 'must be read in view of the specification, of which they are a part.'" *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979 (en banc)). "[T]he specification 'is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.'" *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am.*

Corp., 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Phillips*, 415 F.3d at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms "where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone." *Teleflex*, 299 F.3d at 1325. But, "[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims." *Comark Commc'ns, Inc. v. Harris Corp.*, 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc., v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) ("As in the case of the specification, a patent applicant may define a term in prosecuting a patent."). "[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is "less significant than the intrinsic record in determining the legally operative meaning of claim language." *Phillips*, 415 F.3d at 1317 (citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too

broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert's conclusory, unsupported assertions as to a term's definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is "less reliable than the patent and its prosecution history in determining how to read claim terms." *Id.*

The Supreme Court of the United States has "read [35 U.S.C.] § 112, ¶ 2 to require that a patent's claims, viewed in light of the specification and prosecution history, inform those skilled in the art about the scope of the invention with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2129 (2014). "A determination of claim indefiniteness is a legal conclusion that is drawn from the court's performance of its duty as the construer of patent claims." *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed. Cir. 2005) (citations and internal quotation marks omitted), *abrogated on other grounds by Nautilus,* 134 S. Ct. 2120.

III. THE PARTIES' STIPULATED TERMS

The parties reached agreement on constructions as stated in their July 29, 2016 P.R. 4-3 Joint Claim Construction and Prehearing Statement (Dkt. No. 59 at 2-5) and their September 23, 2016 Joint Claim Construction Chart (*see* Dkt. No. 80 at Ex. A). Those agreements are set forth in Appendix A to the present Claim Construction Memorandum and Order.

IV. DISPUTED TERMS IN U.S. PATENT NO. 7,126,174

The '174 Patent, titled "Semiconductor Device and Method of Manufacturing the Same," issued on October 24, 2006, and bears an earliest priority date of July 24, 1999. Plaintiff submits

that "[t]he '174 patent relates to a novel transistor that is manufactured in a manner that minimizes its size." Dkt. No. 67 at 1.

A. "a trench isolation surrounding an active area of a semiconductor substrate"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term does not need construction and can be understood under its plain and ordinary meaning. To the extent a construction is necessary: "a trench isolation region separating an active area of a semiconductor substrate from other areas of the semiconductor substrate"	"the trench isolation region forms the lateral boundary of an active area of a semiconductor substrate"

Dkt. No. 59, Ex. A at 20; *id.*, Ex. B at B-13. The parties submit that this term appears in Claim 1 of the '174 Patent. Dkt. No. 59, Ex. A at 20; *id.*, Ex. B at B-13.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "Plain and ordinary meaning (Reject Defendants' proposal of 'lateral boundary[']."

(1) The Parties' Positions

Plaintiff submits that "the words making up the phrase are readily understandable," and Plaintiff argues that Defendants' proposal "does not provide clarity to the term." Dkt. No. 67 at 2.

Defendants respond that "[w]ithout clarification, the term 'surrounding' could be understood to mean that the trench isolation region forms the boundary of the active area in either just one dimension, or in all dimensions (*i.e.*, above, below, and laterally)." Dkt. No. 73 at 2.

Plaintiff replies that "swapping of the commonly used word 'surrounding' for the uncommon phrase 'forms the lateral boundary of' is unhelpful to a jury and finds no support in

the intrinsic record (nor do Defendants cite any)." Dkt. No. 77 at 1. Plaintiff also urges that "a jury would understand how a trench isolation region 'surrounds' the active area, in the same way it would understand how a trench would surround any structure, such as a moat surrounds a castle." *Id.*

At the October 7, 2016 hearing, Defendants were amenable to a construction of plain meaning, but Defendants objected to Plaintiff's argument that the isolation region need not abut the active area. Defendants submitted that in all disclosed and illustrated embodiments, the isolation region abuts the perimeter of the active area.

(2) Analysis

Claim 1 of the '174 Patent recites (emphasis added):

> 1. A semiconductor device, comprising:
> *a trench isolation surrounding an active area of a semiconductor substrate*;
> a gate insulating film formed over the active area;
> a gate electrode formed over the gate insulating film;
> first L-shaped sidewalls formed over the side surfaces of the gate electrode;
> first silicide layers formed on regions located on the sides of the first L-shaped sidewalls within the active area[;]
> an interconnection formed on the trench isolation; and
> second L-shaped sidewalls formed over the side surfaces of the interconnection.

On balance, the word "surrounding" is sufficiently clear when read in context, and Defendants' proposal of "lateral boundary" would tend to confuse rather than clarify the scope of the claim. In particular, Plaintiff's expert has persuasively opined that whereas a "boundary" may be a border, a "trench" is a three-dimensional structure. *See* Dkt. No. 67-1, Aug. 26, 2016 Schubert Decl. at ¶ 36. Further, Defendants' proposal of "lateral" would improperly limit the relative orientation of claim elements to a particular illustrated embodiment. *See* '174 Patent at Fig. 15(f); *see also MBO Labs., Inc. v. Becton, Dickinson & Co.*, 474 F.3d 1323, 1333 (Fed. Cir.

2007) ("patent coverage is not necessarily limited to inventions that look like the ones in the figures").

The Court therefore hereby expressly rejects Defendants' proposed construction. No further construction is necessary. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997) ("Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy."); *see also O2 Micro Int'l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) ("[D]istrict courts are not (and should not be) required to construe every limitation present in a patent's asserted claims."); *Finjan, Inc. v. Secure Computing Corp.*, 626 F.3d 1197, 1207 (Fed. Cir. 2010) ("Unlike *O2 Micro*, where the court failed to resolve the parties' quarrel, the district court rejected Defendants' construction."); *ActiveVideo Networks, Inc. v. Verizon Commcn's, Inc.*, 694 F.3d 1312, 1326 (Fed. Cir. 2012); *Summit 6, LLC v. Samsung Elecs. Co., Ltd.*, 802 F.3d 1283, 1291 (Fed. Cir. 2015).

The Court therefore hereby construes **"a trench isolation surrounding an active area of a semiconductor substrate"** to have its **plain meaning**.

B. "composed of the same material"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"composed of material having the same chemical formula"; This construction does not require identity between the types and quantities of contaminants, impurities and/or dopants added to the material.[2]	Plain and ordinary meaning To the extent the plain and ordinary meaning must be stated, "composed of material having the same composition"

[2] Plaintiff previously proposed that this term does not require construction. Dkt. No. 59, Ex. A at 20.

Dkt. No. 59, Ex. B at B-14; Dkt. No. 67 at 3. The parties submit that this term appears in Claim 11 of the '174 Patent. Dkt. No. 59, Ex. A at 20; *id.*, Ex. B at B-14.

In their September 23, 2016 Joint Claim Construction Chart, the parties submitted an agreement that this term has its "[p]lain and ordinary meaning." Dkt. No. 80, Ex. A at 2. The Court therefore sets forth the parties' agreement in Appendix A to the present Claim Construction Memorandum and Order.

V. DISPUTED TERMS IN U.S. PATENT NO. 8,354,726

The '726 Patent, titled "Semiconductor Device and Method for Fabricating the Same," issued on January 15, 2013, and bears an earliest priority date of May 19, 2006. Plaintiff submits that "[t]he '726 patent presents a novel structure that improves the efficiency of transistors." Dkt. No. 67 at 4.

C. "formed on the side surface of the [first/second] gate electrode"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"substantially covering the side surface of the [first/second] gate electrode"[3]	"formed in contact with the side surface of the [first/second] gate electrode"

Dkt. No. 59, Ex. B at B-17; Dkt. No. 67 at 5. The parties submit that this term appears in Claims 1 and 43 of the '726 Patent. Dkt. No. 59, Ex. A at 24; *id.*, Ex. B at B-17.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "covering the side surface of the [first/second] gate electrode."

[3] Plaintiff previously proposed that this term does not require construction. Dkt. No. 59, Ex. A at 24.

(1) The Parties' Positions

Plaintiff argues that "[a] POSITA [(person of ordinary skill in the art)] would understand that if a side-wall insulating film or sidewall is 'formed on' the side surface of a gate electrode, then the side-wall insulating film/sidewall substantially covers the side surface of the gate electrode because a side-wall insulating film/sidewall is intended to provide electric insulation for the gate electrode and act as a spacer for proper implementation." Dkt. No. 67 at 5. Plaintiff argues that Defendants' proposed interpretation is inconsistent with the context of the claims, would exclude a preferred embodiment, and would give rise to an inconsistency in dependent Claim 22. *Id.* at 5-6.

Defendants respond that "each of the figures in the '726 Patent illustrating the 'formed on' feature shows the elements being formed in contact with the side surface of the first and second gate electrodes." Dkt. No. 73 at 6. Defendants also submit that "the claims use language different from 'formed on' to describe instances where elements are not in direct contact." *Id.* Further, Defendants argue, "Plaintiff's proposed construction eliminates the word 'formed' entirely from the term," and "nowhere in the '726 patent specification does the term 'substantially cover' (or any derivation thereof) appear at all." *Id.* at 7.

Plaintiff replies that "Defendants rely on various figures that illustrate non-limiting embodiments in the specification." Dkt. No. 77 at 1 (citation omitted).

At the October 7, 2016 hearing, Plaintiff agreed with the Court's preliminary construction.

(2) Analysis

Claim 43 of the '726 Patent, for example, recites (emphasis added):

43. A semiconductor device comprising:

a first active region surrounded with an isolation region of a semiconductor substrate;

a first gate electrode formed over the first active region and having a protrusion protruding on the isolation region;

a first side-wall insulating film *formed on the side surface of the first gate electrode*;

a second active region surrounded with the isolation region of the semiconductor substrate;

a second gate electrode formed over the second active region, having a protrusion protruding on the isolation region, and formed over the semiconductor substrate to be spaced apart in the gate width direction from the protrusion of the first gate electrode;

a second side-wall insulating film *formed on the side surface of the second gate electrode*; and

a silicon nitride film formed to cover the first gate electrode, the first side-wall insulating film, the second gate electrode, and the second side-wall insulating film,

wherein the distance between the first gate electrode and the second gate electrode is smaller than the sum total of: the sum of the thicknesses of the first and second side-wall insulating films; and the double of the thickness of the silicon nitride film,

the side surfaces of the first and second gate electrodes are shifted in the gate length direction with each other,

a shift distance of the second gate electrode with respect to the first gate electrode is 0 μm or more and less than a predetermined value,

the predetermined value is a sum of: a sum of a gate length of the first gate electrode and a total thickness of the first side-wall insulating film and a part of the silicon nitride film *formed on the side surface of the first gate electrode*; and a total thickness of the second side-wall insulating film and a part of the silicon nitride film *formed on the side surface of the second gate electrode*.

The specification discloses that structures may be "formed between" gate electrodes and sidewalls:

> In FIGS. 14, 15A, and 15B, description has been made of the structure in which only the first sidewalls 15a and 15b having L-shaped cross sections are present. Alternatively, it is also acceptable that in addition to the first sidewalls 15a and 15b, a sidewall (an offset spacer) having an I-shaped (plate-like) cross section is *formed between* the gate electrodes 13a and 13b and the associated first sidewalls 15a and 15b. The liner film 19 may be formed of a single layer or multiple layers.

'726 Patent at 21:40-48 (emphasis added).

On one hand, although Plaintiff has argued that the disputed term must be construed so as to encompass this disclosure of potentially intervening layers, "[i]t is not necessary that each claim read on every embodiment." *Baran v. Med. Device Techs., Inc.*, 616 F.3d 1309, 1316 (Fed. Cir. 2010). Also, dependent Claim 22, cited by Plaintiff, recites that "the first side-wall insulating film further includes an offset spacer having a plate-like cross section," but this recital of a sidewall that "includes" a spacer does not warrant allowing for a distinct intermediate layer.

Further, Defendants' proposed interpretation appears to be consistent with the recital in Claims 1, 8, 29, 34, and 43 that the second gate electrodes are "formed over" (not "formed on") respective active areas. *See, e.g., Chi. Bd. Options Exch., Inc. v. Int'l Sec. Exch., LLC*, 677 F.3d 1361, 1369 (Fed. Cir. 2012) (noting "[t]he general presumption that different terms have different meanings"). Likewise, Claims 20, 21, and 41 recite that "the first gate electrode is formed on the first active region *through* a gate insulating film."

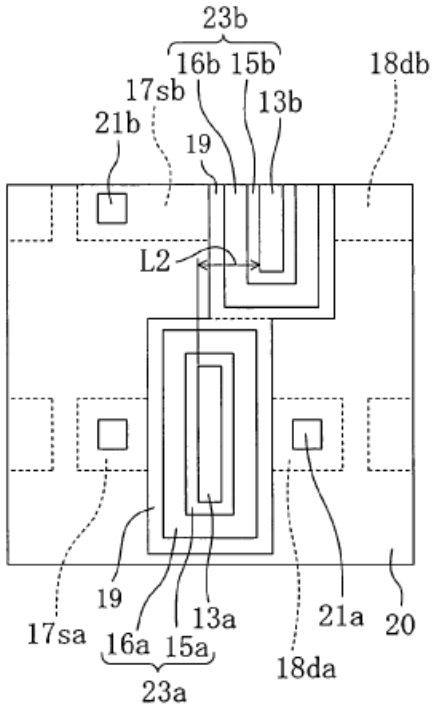
On the other hand, the specification also uses the phrase "formed on" despite the presence of intervening layers:

> For a typical semiconductor device, there may be the case where it is impossible to arrange the gate electrode 13a and the gate electrode 13b to face each other and thus as shown in FIG. 5A, they are disposed closely but in shifted relation. Even in such a case, if as shown in FIG. 5B, the gate shift distance L2 is not less than 0 μm and less than 0.39 μm, the effect of reducing compressive stress in the channel width direction of the active region 10a, which is applied by a portion of the liner film 19 covering the protrusion of the gate electrode 13a, can be exerted. In this structure, 0.39 μm, which is the gate shift distance L2 described above, is the sum total of: the gate length of the gate electrode 13a (50 nm); the sum of the thicknesses of the first and second sidewalls 15a and 16a *formed on* one side surface of the gate electrode 13a and the thickness of the liner film 19 (20 nm+50 nm+100 nm=170 nm); and the sum of the thicknesses of the first and second sidewalls 15b and 16b *formed on* one side surface of the gate electrode 13b and the thickness of the liner film 19 (20 nm+50 nm+100 nm=170 nm). That is to say, if the amount of shift of the gate electrode 13b in the gate length direction relative to the gate electrode 13a is within an extent such that the portion of the liner film 19 *formed on* the side surface of the gate electrode 13a and the portion of the liner film 19 *formed on* the side surface of the gate electrode 13b at least

partly overlap in the gate length direction, the effects as described above can be provided.

'726 Patent at 14:14-39 (emphasis added). Referenced Figure 5A of the '726 Patent is reproduced here and illustrates the sidewalls residing between the liner film and the gate electrodes:

FIG. 5A



On balance, this disclosure in the '726 Patent demonstrates that the term "formed on" does not preclude the presence of intervening layers. As to the proper construction, Plaintiff has not adequately supported its proposal of the word "substantially," which would tend to introduce vagueness without Plaintiff having shown any necessity for the word.

The Court therefore hereby construes **"formed on the side surface of the [first/second] gate electrode"** to mean **"covering the side surface of the [first/second] gate electrode."**

D. "a stress-containing insulating film containing internal stress and formed to cover the first gate electrode, the first side-wall insulating film, the auxiliary pattern, and the second side-wall insulating film"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term does not need construction and can be understood under its plain and ordinary meaning. To the extent a construction is necessary: "a stress-containing insulating film containing internal stress and fabricated to cover the first gate electrode, the first side-wall insulating film, the auxiliary pattern, and the second side-wall insulating film"	"a single stress-containing insulating film containing internal stress and covering the first gate electrode, the first side-wall insulating film, the auxiliary pattern, and the second side-wall insulating film"[4]

Dkt. No. 59, Ex. A at 25; Dkt. No. 80, Ex. A at 3. The parties submit that this term appears in Claim 1 of the '726 Patent. Dkt. No. 59, Ex. A at 25; *id.*, Ex. B at B-18.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "a stress-containing insulating film containing internal stress and also covering the first gate electrode, the first side-wall insulating film, the auxiliary pattern, and the second side-wall insulating film."

At the October 7, 2016 hearing, both sides stated that they had no objection to the Court's preliminary construction. The parties reached this agreement based on an understanding that although a single film must satisfy all of the stated requirements, this disputed term does *not* require that there be only *one* stress-containing insulating film.

The Court therefore hereby construes **"a stress-containing insulating film containing internal stress and formed to cover the first gate electrode, the first side-wall insulating film, the auxiliary pattern, and the second side-wall insulating film"** to mean **"a stress-containing insulating film containing internal stress and also covering the first gate**

[4] Defendants previously proposed "completely covering." Dkt. No. 59, Ex. B at B-18.

electrode, the first side-wall insulating film, the auxiliary pattern, and the second side-wall insulating film."

E. "the first gate electrode is formed on the first active region through a gate insulating film including nitrogen"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"the first gate electrode is formed on a gate insulating film including nitrogen, and the gate insulating film is formed on the first active region"	Plain and ordinary meaning To the extent stating the plain and ordinary meaning is necessary, "the first gate electrode is formed on the first active region with a gate insulating film between the first gate electrode and the first active region, the gate insulating film including nitrogen."

Dkt. No. 59, Ex. A at 27; *id.*, Ex. B at B-20. The parties submit that this term appears in Claims 20, 43, and 54 of the '726 Patent. Dkt. No. 59, Ex. A at 27; *id.*, Ex. B at B-20.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "the first gate electrode is formed on the first active region, with a nitrogen-containing gate insulating film between the first gate electrode and the first active region."

(1) The Parties' Positions

Plaintiff submits that the parties' proposed constructions "appear equivalent," but Plaintiff argues that "its construction is easier for a jury to understand, as it approaches the construction in a logical order, *i.e.*, it has the format 'C is formed on B, and B is formed on A,' while defendants' proposed construction has the form 'C is formed on A, with B between C and A.'" Dkt. No. 67 at 8.

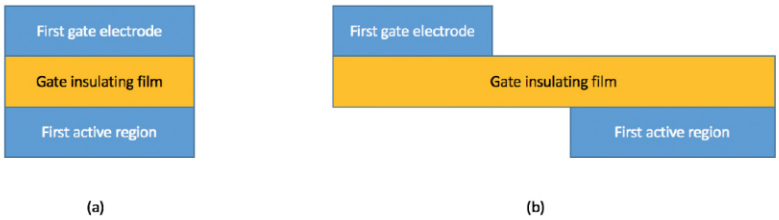
Defendants respond that the parties' proposals are not equivalent and that Plaintiff's proposal would improperly broaden the claim scope. Dkt. No. 73 at 9.

Plaintiff's reply brief does not address this term. *See* Dkt. No. 77.

At the October 7, 2016 hearing, Defendants had no objection to the Court's preliminary construction.

(2) Analysis

Defendants have persuasively argued that Plaintiff's proposed construction—which at least on its face appears to encompass what is labeled as "b" in Defendants' below-reproduced illustration—would improperly broaden the scope of the claims:



Dkt. No. 73 at 9.

The Court therefore hereby construes **"the first gate electrode is formed on the first active region through a gate insulating film including nitrogen"** to mean **"the first gate electrode is formed on the first active region, with a nitrogen-containing gate insulating film between the first gate electrode and the first active region."**

F. "an interlayer insulating film on the silicide layer through the stress-containing insulating film"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"an interlayer insulating film is formed on a portion of the stress-containing insulating film over the silicide layer"	Plain and ordinary meaning To the extent stating the plain and ordinary meaning is necessary, "an interlayer insulating film formed on the silicide layer, with the stress-containing insulating film being between the interlayer insulating film and the silicide layer."

Dkt. No. 59, Ex. A at 28; *id.*, Ex. B at B-21. The parties submit that this term appears in Claims 23 and 57 of the '726 Patent. Dkt. No. 59, Ex. A at 28; *id.*, Ex. B at B-21.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "an interlayer insulating film formed on the silicide layer, with the stress-containing insulating film being between the interlayer insulating film and the silicide layer."

(1) The Parties' Positions

Plaintiff submits that the parties' proposed constructions "appear equivalent," but Plaintiff argues that "its construction is easier for a jury to understand, as it approaches the construction in a logical order, *i.e.*, it has the format 'C is formed on a portion of B formed on A,' while defendants' proposed construction has the form 'C is formed on A, with B between C and A.'" Dkt. No. 67 at 8.

Defendants submit that this term presents the same dispute as "the first gate electrode is formed on the first active region through a gate insulating film including nitrogen," which is addressed above. Dkt. No. 73 at 10.

Plaintiff's reply brief does not address this term. *See* Dkt. No. 77.

(2) Analysis

This disputed term presents substantially the same dispute as addressed above regarding the term "the first gate electrode is formed on the first active region through a gate insulating film including nitrogen."

The Court therefore hereby construes **"an interlayer insulating film on the silicide layer through the stress-containing insulating film"** to mean **"an interlayer insulating film formed on the silicide layer, with the stress-containing insulating film being between the interlayer insulating film and the silicide layer."**

VI. DISPUTED TERMS IN U.S. PATENT NO. 6,197,696

The '696 Patent, titled "Method for Forming Interconnection Structure," issued on March 6, 2001, and bears an earliest priority date of March 26, 1998. Plaintiff submits that "[t]he '696 patent discloses a novel method for forming an interconnection structure in a semiconductor device." Dkt. No. 67 at 9.

G. "using the [first resist pattern/second resist pattern and the mask pattern/patterned third insulating film] as a mask"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"using the [first resist pattern/second resist pattern and the mask pattern/patterned third insulating film] to define areas for etching"	"using the [first resist pattern/second resist pattern and the mask pattern/patterned third insulating film] to mask portions of another film or films being etched . . ."

Dkt. No. 59, Ex. A at 8; *id.*, Ex. B at B-23; Dkt. No. 80, Ex. A at 10. The parties submit that this term appears in Claim 13 of the '696 Patent. Dkt. No. 59, Ex. A at 8; *id.*, Ex. B at B-23.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "using the [first resist pattern/second resist pattern and the mask pattern/patterned third insulating film] to define areas for etching."

(1) The Parties' Positions

Plaintiff argues that "[t]he specification discloses numerous examples of structures being used as masks during etching, and in each case the structures are defining areas for etching." Dkt. No. 67 at 9 (citing '696 Patent at 22:47-24:19, 24:54-26:34, 26:52-27:60, 27:62-29:20, 29:62-31:26, 31:49-32:9 & Figs. 21-37). Plaintiff argues that Defendants' proposed construction "merely repeats the claim language" and "is incorrect because the masked portions of a film, by definition, are *not* etched—instead, the masked portions are *shielded* from etching." Dkt. No. 67 at 9.

Defendants respond that "Defendants' proposal recognizes the plain and ordinary meaning of th[e] term, as reflected in the specification, that etching an underlying film 'using [a pattern/film] as a mask' means that the pattern/film is used to mask certain portions of that underlying film." Dkt. No. 73 at 10.

Plaintiff replies that Defendants' proposal "merely repeats the word 'mask' without explaining what it is or does." Dkt. No. 77 at 3.

At the October 7, 2016 hearing, Defendants argued that Plaintiff's proposal improperly broadens the scope of the disputed term by encompassing any masks that may have been used in preceding fabrication steps.

(2) Analysis

The parties do not appear to have any substantive disagreement. As Plaintiff has argued, however, Defendants' proposed construction is potentially confusing as to which portions are etched and which are not. As to Defendants' argument that Plaintiff's proposed construction might "capture process steps wholly unrelated to the actual etching process" (Dkt. No. 73 at 11), the surrounding claim language recites etching. To be clear, however, and as Plaintiff appeared

to agree at the October 7, 2016 hearing, "using . . . as a mask" refers to using a mask for the particular fabrication step recited in the limitation at issue (rather than some preceding, preparatory step).

The Court therefore hereby construes **"using the [first resist pattern/second resist pattern and the mask pattern/patterned third insulating film] as a mask"** to mean **"using the [first resist pattern/second resist pattern and the mask pattern/patterned third insulating film] to define areas for etching."**

VII. DISPUTED TERMS IN U.S. PATENT NO. 6,538,324

The '324 Patent, titled "Multi-Layered Wiring Layer and Method of Fabricating the Same," issued on March 25, 2003, and bears an earliest priority date of June 24, 1999. Plaintiff submits that "[t]he '324 patent discloses a novel barrier film that can be used to prevent diffusion of copper from a copper wiring layer formed on a semiconductor substrate." Dkt. No. 67 at 10.

H. Preambles of Claims 1 and 5 of the '324 Patent

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
The phrase "[preventing/which prevents] diffusion of copper from a copper wiring layer formed on a semiconductor substrate" in the preamble is not limiting. The remaining portions of the preamble are limiting.[5]	The preamble is limiting

Dkt. No. 59, Ex. B at B-1; Dkt. No. 67 at 10; Dkt. No. 80, Ex. A at 12.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "The phrase '[a] barrier film preventing diffusion of copper from a copper wiring layer formed on a semiconductor substrate' in Claim 1 and the

[5] Plaintiff previously proposed simply: "Preamble is not limiting." Dkt. No. 59, Ex. A at 1.

phrase 'prevents diffusion of copper from a copper wiring layer formed on a semiconductor substrate' in Claim 5 are *not limiting*."

(1) The Parties' Positions

Plaintiff argues that "[i]t is well-settled that statements of purpose are non-limiting," and therefore "the above phrase describing the purpose of the barrier film is not limiting." Dkt. No. 67 at 10-11.

Defendants respond that "Plaintiff cites no authority to support that a preamble can be dissected in such manner." Dkt. No. 73 at 12. Defendants also argue that "[t]he preambles of claims 1 and 5 in their entirety are necessary to understand the claims as a whole and to define their relationship with another feature in the structure, specifically a copper wiring layer." *Id.* at 13.

Plaintiff replies by citing *TomTom, Inc. v. Adolph*, 790 F.3d 1315, 1323-24 (Fed. Cir. 2015), which Plaintiff submits found that whereas the portions of the preamble that provided antecedent bases were limiting, the portion stating a purpose or intended use was not. Dkt. No. 77 at 4.

At the October 7, 2016 hearing, Defendants urged that the copper wiring layer set forth in the preamble of each claim is a structural limitation of the claim.

(2) Analysis

Claims 1 and 5 of the '324 Patent recite (emphasis added):

> 1. *A barrier film* preventing diffusion of copper from a copper wiring layer formed on a semiconductor substrate, comprising a multi-layered structure of *first and second films*,
>
> *said first film* being composed of crystalline metal containing nitrogen therein,
>
> *said second film* being composed of amorphous metal nitride,
>
> *said barrier film* being constituted of common metal atomic species,
>
> *said first film* being formed on *said second film*,

said first film in direct contact with *said second film*,
said first film containing nitrogen in a smaller content than that of *said second film*.

* * *

5. A multi-layered wiring structure comprising *a barrier film* which prevents diffusion of copper from a copper wiring layer formed on a semiconductor substrate,
said barrier film having a multi-layered structure of first and second films,
said first film being composed of crystalline metal containing nitrogen therein,
said second film being composed of amorphous metal nitride,
said barrier film being constituted of common metal atomic species,
said first film being formed on said second film,
said first film in direct contact with said second film,
said first film containing nitrogen in a smaller content than that of said second film.

The above-emphasized reliance upon the preambles for antecedent basis weighs in favor of finding the preambles limiting. *See Eaton*, 323 F.3d at 1339.

Nonetheless, the preamble phrases regarding preventing diffusion are statements of purpose or use and are not inextricably intertwined with the other preamble language that provides antecedent basis. *See TomTom*, 790 F.3d at 1323 ("That [a] phrase in the preamble . . . provides a necessary structure for [the] claim . . . does not necessarily convert the entire preamble into a limitation, particularly one that only states the intended use of the invention."); *see also Marrin v. Griffin*, 599 F.3d 1290, 1294-95 (Fed. Cir. 2010) ("the mere fact that a structural term in the preamble is part of the claim does not mean that the preamble's statement of purpose or other description is also part of the claim").

Likewise, the specification disclosures cited by Defendants do not contain any definition or disclaimer that would warrant finding the entireties of the preambles limiting. *See* '324 Patent at 1:6-10 & 1:26-30; *see also id.* at 4:50-67, 5:1-8, 5:15-24, 6:42-52, 8:60-63, 9:47-65, 13:30-33, 13:51-63, 15:11-13, 15:40-42, 17:12-16, 17:35-39 & 18:17-50.

In particular, the Background of the Invention states that "it is absolutely necessary for a semiconductor device having a copper wiring layer to have a diffusion-barrier film for preventing diffusion of copper into an interlayer insulating film formed between copper wiring layers." *Id.* at 1:26-30. Nonetheless, the claims at issue recite complete structures apart from the statements of purpose, and the preamble phrases at issue do not specify any additional detail as to composition of those structures. *See Proveris Scientific Corp. v. Innovasystems, Inc.*, 739 F.3d 1367, 1373 (Fed. Cir. 2014) ("The phrase 'the image data' clearly derives antecedent basis from the 'image data' that is *defined in greater detail in the preamble* as being 'representative of at least one sequential set of images of a spray plume.'") (emphasis added); *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1468 (Fed. Cir. 1990) ("apparatus claims cover what a device is, not what a device does").

The Court therefore hereby finds that the phrase "[a] barrier film preventing diffusion of copper from a copper wiring layer formed on a semiconductor substrate" in Claim 1 and the phrase "prevents diffusion of copper from a copper wiring layer formed on a semiconductor substrate" in Claim 5 are **not limiting**.

I. "film"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a single layer or coating, or multiple contiguous layers or coatings, of material"	Defendants dispute that the term "film" needs to be construed or should be construed in isolation. The term "film" is used in different contexts in the patent and the claims (e.g., "barrier film," ["]diffusion barrier film," "first film," "second film") and these different contexts do not lend themselves to a singular definition of "film" in the absence of these contexts. Accordingly, the term "film" by itself can be understood under its plain and ordinary meaning in a given context, and requires no construction.

Dkt. No. 59, Ex. A at 1; *id.*, Ex. B at B-1. The parties submit that this term appears in Claims 1 and 5 of the '324 Patent. Dkt. No. 59, Ex. A at 1; *id.*, Ex. B at B-1.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "Plain and ordinary meaning."

(1) The Parties' Positions

Plaintiff submits that "film" has a well-understood meaning, and Plaintiff argues that "Defendants contend, wrongly, that a single 'film' can be comprised of multiple films or layers that are *not* contiguous (*i.e.*, that are completely separated by other layers or elements)." Dkt. No. 67 at 11. Plaintiff submits that the specification consistently discloses that when a film does include multiple layers or coatings, those layers or coatings must be contiguous and not completely separated by other elements. *Id.* at 12.

Defendants respond that Plaintiff's proposal of "contiguous" is inconsistent with the specification and is unclear. Dkt. No. 73 at 14. Defendants also argue that "[t]he term 'coating' is undefined and appears nowhere in the specification." *Id.* at 15. Further, Defendants submit that "the distinction between 'single' and 'multiple' layers is unnecessary—as Plaintiff recognizes, which films do or do not contain multiple layers is readily apparent from the context in which each film is described in the specification and claims." *Id.*

Plaintiff replies that the term "film" should be construed consistently across the '324 and '980 Patents, and Plaintiff submits that "[e]very depiction of a multilayered film in the '324 and '980 patents shows that the multiple layers are contiguous." Dkt. No. 77 at 4 (emphasis omitted; citations omitted).

(2) Analysis

Claims 1 and 5 of the '324 Patent expressly recite that a barrier film can include a "multi-layered" structure. On balance, Plaintiff has not demonstrated a need for introducing a "contiguous" limitation, which would tend to confuse rather than clarify the scope of the claims. Of particular note, the word "contiguous" does not appear in the specification.

The Court therefore hereby expressly rejects Plaintiff's proposed construction. No further construction is necessary. *See U.S. Surgical*, 103 F.3d at 1568; *see also O2 Micro*, 521 F.3d at 1362; *Finjan*, 626 F.3d at 1207; *ActiveVideo*, 694 F.3d at 1326; *Summit 6*, 802 F.3d at 1291.

The Court accordingly hereby construes **"film"** to have its **plain meaning**.

J. "said first film being composed of crystalline metal containing nitrogen therein"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"said first film is composed of a mixture of single crystalline or polycrystalline metal with nitrogen throughout"[6]	"said first film, being distinct from the second film, consisting essentially of a crystalline or polycrystalline metal, and also containing nitrogen" (The phrase "composed of" is understood to be closed-ended)

Dkt. No. 59, Ex. A at 2; *id.*, Ex. B at B-3; Dkt. No. 67 at 13. The parties submit that this term appears in Claims 1 and 5 of the '324 Patent. Dkt. No. 59, Ex. A at 2; *id.*, Ex. B at B-3.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "'the first film is distinct from the second film, and the first film consists essentially of a mixture of crystalline or polycrystalline metal with nitrogen throughout' (Reject Defendants' proposal of 'closed-ended')."

[6] Plaintiff previously proposed: "said first film containing a mixture of metal and nitrogen throughout and having a polycrystalline or single crystal structure." Dkt. No. 67 at 13.

(1) The Parties' Positions

Plaintiff argues that the specification discloses metal and nitrogen being "in mixture," and Plaintiff urges that Defendants' proposal, "which permits the film to have nitrogen in only a portion of it (*e.g.*, in an upper or lower portion of the film), is inconsistent with these disclosures and the purpose of the invention." Dkt. No. 67 at 13-14. Plaintiff also argues that whereas "the claims themselves provide specific physical limitations that distinguish the two films from one another," Defendants' proposal of "distinct" would "add[] unnecessary ambiguity because it could be understood to require a clear or exact demarcation between the two films, when such a requirement is contradicted by the specification." *Id.* at 14. Finally, Plaintiff argues that Defendants' proposal of a "closed-ended" construction should be rejected because "[n]o material is one hundred percent pure," and "atoms from adjacent films may diffuse at least partway into the barrier film, and thus be detectable in the barrier film." *Id.* at 15.

Defendants respond that "Defendants' proposed construction and use of the word 'distinct' simply makes clear what is inherent in the claims themselves—that the first and second films are separately identifiable films, with different compositions." Dkt. No. 73 at 16. Defendants also argue that "Defendants' proposed construction recognizes the well-established rule that the term 'composed of' in a claim is a closed-ended phrase that is equivalent to 'consisting essentially of,' and clarifies the meaning of the term for the jury." *Id.* at 17 (citing *AFG Indus., Inc. v. Cardinal IG Co.*, 239 F.3d 1239, 1245 (Fed. Cir. 2001) (based on specification and other evidence, "composed of" interpreted in same manner as "consisting essentially of")). Finally, Defendants argue that "the claim language 'crystalline metal containing nitrogen therein' makes no reference to Plaintiff's characterization that nitrogen must [be] distributed throughout the film." Dkt. No. 73 at 17.

Plaintiff replies that "Defendants' arguments do not resolve the ambiguity created by their importing the word 'distinct,' which appears nowhere in the specification, into the claim language, and provide no explanation of how 'distinctness' is determined and what it requires." Dkt. No. 77 at 5 (citation omitted). Plaintiff also submits that "Defendants' proposal that 'composed of' is closed-ended should be rejected because Defendants concede that 'composed of' allows for 'the existence of contaminants, trace elements, and imperfections.'" *Id.* (citing Dkt. No. 73 at 17 n.11). Plaintiff also replies that its proposal of "throughout" "does not mean perfect uniform distribution" but rather merely "present across the entire thickness of the film." Dkt. No. 77 at 6.

At the October 7, 2016 hearing, Plaintiff urged that its proposal of "throughout" is essential for preventing copper diffusion. *See* '324 Patent at 6:37-41 & 9:47-50.

(2) Analysis

As to Plaintiff's proposal of requiring metal "with nitrogen throughout," the disputed term refers to a film "composed of crystalline metal containing nitrogen therein." The parties appear to dispute whether the nitrogen can be contained in a region of the metal or rather must be contained throughout the metal.

The specification discloses, for example, that different material properties can be achieved by varying the power used in a sputtering process:

> Specifically, when RF power is equal to 2 kW, there is obtained amorphous Ta_2N, as illustrated in FIG. 15. By increasing RF power, there is obtained crystalline $TaN_{0.1}$. When RF power is equal to 8 kW, there is obtained a crystalline metal film containing nitrogen therein, which includes a β-Ta film and $TaN_{0.1}$ in mixture.

'324 Patent at 12:62-67.

On balance, the better reading of the plain language of the claim is that the metal must contain nitrogen throughout. Plaintiff's expert persuasively opines that the context in which the film is created supports this conclusion because the specification describes a metal "in mixture" with a nitrogen-containing metal. *See* Dkt. No. 67-2, Aug. 26, 2016 Glew Decl. at ¶ 45 (citing '324 Patent at 12:19-24, 12:62-67, 13:4-24, 13:57-63 & 16:41-47); *see also id.* at ¶¶ 46-47; '324 Patent at 13:35-45 (discussing that nitrogen combines with metal at the target, and target material is then sputtered and deposited).

As to Defendants' proposal of "distinct," Plaintiff's expert has persuasively opined that persons of ordinary skill in the art expect that some imperfections will exist because of manufacturing limitations. *See id.* at ¶¶ 48-49; *see also* '324 Patent at Figs. 21 & 22. Nonetheless, the claims separately recite a "first film" and a "second film," and Defendants' proposal of "distinct" is appropriate so as to require separately identifiable films. *See Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) ("Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct component[s] of the patented invention.") (citation and internal quotation marks omitted).

To whatever extent the parties dispute the required degree of distinctness, such a dispute is a question of fact regarding infringement rather than a legal question for claim construction. *See Acumed LLC v. Stryker Corp.*, 483 F.3d 800, 806 (Fed. Cir. 2007) ("The resolution of some line-drawing problems . . . is properly left to the trier of fact.") (citing *PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1355 (Fed. Cir. 1998) ("after the court has defined the claim with whatever specificity and precision is warranted by the language of the claim and the evidence bearing on the proper construction, the task of determining whether the construed claim reads on

the accused product is for the finder of fact")); *see EON Corp. IP Holdings LLC v. Silver Springs Networks, Inc.*, 815 F.3d 1314, 1318-19 (Fed. Cir. 2016) (citing *PPG*). At a minimum, however, Defendants acknowledged at the October 7, 2016 hearing that "distinct" does not preclude some intermingling at the boundaries, such as illustrated in Figures 21 and 22 of the '324 Patent.

Finally, as to Defendants' proposal that "composed of" must be "closed-ended," the Court of Appeals for the Federal Circuit has found "composed of" to mean "consisting essentially of." *AFG*, 239 F.3d at 1245. Thus, "composed of" is neither completely open-ended nor completely closed-ended.

Based on the foregoing, the Court hereby construes **"said first film being composed of crystalline metal containing nitrogen therein"** to mean **"the first film is distinct from the second film, and the first film consists essentially of a mixture of crystalline or polycrystalline metal with nitrogen throughout."**

K. "said second film being composed of amorphous metal nitride"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"said second film is composed of a noncrystalline metal nitride throughout"[7]	"said second film, being distinct from the first film, consisting essentially of an amorphous structure of metal nitride" (The phrase "composed of" is understood to be closed-ended)

Dkt. No. 59, Ex. B at B-4; Dkt. No. 67 at 16. The parties submit that this term appears in Claims 1 and 5 of the '324 Patent. Dkt. No. 59, Ex. A at 4; *id.*, Ex. B at B-4.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "'the second film is distinct from the first film, and

[7] Plaintiff previously proposed: "said second film containing metal nitride throughout and having a noncrystalline structure." Dkt. No. 59, Ex. A at 4.

the second film consists essentially of amorphous metal nitride' (Reject Defendants' proposal of 'closed-ended')."

At the October 7, 2016 hearing, both sides were amenable to the Court's preliminary construction.

The Court therefore hereby construes **"said second film being composed of amorphous metal nitride"** to mean **"the second film is distinct from the first film, and the second film consists essentially of amorphous metal nitride."**

L. "[said barrier film being constituted of] common metal atomic species"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"the layers of the barrier film contain atoms of the same metal"	"the first and second films of the barrier film being composed of common metal atomic species"

Dkt. No. 59, Ex. A at 4; *id.*, Ex. B at B-5-6. The parties submit that this term appears in Claims 1 and 5 of the '324 Patent. Dkt. No. 59, Ex. A at 4; *id.*, Ex. B at B-5-6.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "the layers of the barrier film contain atoms of the same metal."

At the October 7, 2016 hearing, both sides were amenable to the Court's preliminary construction.

The Court therefore hereby construes **"[said barrier film being constituted of] common metal atomic species"** to mean **"the layers of the barrier film contain atoms of the same metal."**

VIII. DISPUTED TERMS IN U.S. PATENT NO. RE41,980

The '980 Patent, titled "Semiconductor Interconnect Formed Over an Insulation and Having Moisture Resistant Material," issued on December 7, 2010, and bears an earliest priority date of September 10, 1996. Plaintiff submits that "[t]he '980 patent discloses a novel semiconductor device structure that includes first and second dielectric films that together form a 'surface protecting film,' and a bonding pad formed in an opening in the surface protecting film." Dkt. No. 67 at 18.

M. "a surface protecting film"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a film for protecting an underlying layer" "film" means "a single layer or coating, or multiple contiguous layers or coatings, of material"	"a surface protecting film including distinct first and second dielectric films"

Dkt. No. 59, Ex. A at 11; *id.*, Ex. B at B-10-11. The parties submit that this term appears in Claims 18 and 35 of the '980 Patent. Dkt. No. 59, Ex. A at 11.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "a surface protecting film including distinct first and second dielectric films."

(1) The Parties' Positions

Plaintiff reiterates its arguments as to the term "film," which is addressed above as to the '324 Patent. Dkt. No. 67 at 19.

Defendants respond that "the parties agree that the plain and ordinary meaning of this term requires a film that protects a *surface*, not an underlying layer." Dkt. No. 73 at 19. Defendants also argue: "that the films are distinct is apparent from the claim language." *Id.*

Plaintiff replies by referring to its arguments as to the term "film," which is addressed above as to the '324 Patent. Dkt. No. 77 at 6. Plaintiff also submits that it "does not intend 'surface' to exclude surfaces of layers below the topmost layer of the chip." *Id.*

At the October 7, 2016 hearing, Defendants submitted that this term presents the same issues regarding Defendants' proposal of "distinct" as to terms in the '324 Patent, addressed above. As to "surface," Defendants argued that the referenced surface is the surface of a chip rather than the surface of a non-exposed layer that is buried within the chip. Plaintiff responded that the disputed term can refer to a film that protects underlying layers.

(2) Analysis

The parties agree that the constituent term "film" should be given the same interpretation in the '980 Patent as in the '324 Patent (discussed above). Thus, no further construction is necessary as to "film."

As to whether a "surface protecting film" protects a surface or protects a layer, the term itself refers to a surface, and Plaintiff has not demonstrated that the word "surface" should be interpreted as referring to a layer rather than a surface. Nonetheless, the context set forth by the specification is sufficiently clear that the "surface" need only be a top surface at some point during fabrication. That is, the protected "surface" need not necessarily be the top surface in a finished semiconductor device. *See, e.g.,* '980 Patent at 17:30-59 ("the passivation film 14 with a large dielectric constant and high moisture absorption resistance is formed on the underlying moisture proofing film 17 and the buried insulating film 13").

Finally, the claims at issue each recite a "first dielectric film" and a "second dielectric film," and Defendants' proposal of "distinct" is appropriate so as to require separately identifiable films. *See Becton*, 616 F.3d at 1254 ("Where a claim lists elements separately, the

clear implication of the claim language is that those elements are distinct component[s] of the patented invention.") (citation and internal quotation marks omitted).

The Court therefore hereby construes **"a surface protecting film"** to mean **"a surface protecting film including distinct first and second dielectric films."**

N. "interlayer insulating film"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"an insulating film located between but not within layers"	"an insulating film located between layers"

Dkt. No. 59, Ex. A at 12; *id.*, Ex. B at B-11. The parties submit that this term appears in Claims 18, 33, 35, and 50 of the '980 Patent. Dkt. No. 59, Ex. A at 12; *id.*, Ex. B at B-11.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "an insulating film located between but not within layers."

(1) The Parties' Positions

Plaintiff argues that the claim language and the specification establish that the claimed interlayer insulating film cannot be located within an adjacent layer. Dkt. No. 67 at 20. For example, Plaintiff argues that the prefix "inter" means "between," as opposed to "intra," which means "within." *Id.*

Defendants respond that none of the disclosures cited by Plaintiff indicate that the interlayer insulating film cannot be formed within layers. Dkt. No. 73 at 20. Defendants also argue: "Nor does the plain language of 'formed on' exclude the scenario where a portion of the layer is also included within the surface of the layer on top of which the layer is being formed." *Id.*

Plaintiff replies that its proposal "is supported by the patent's clear contrast between 'interlayer insulating film' and 'buried insulating film,' as well as the dictionary definitions of 'intra' and 'inter.'" Dkt. No. 77 at 6-7 (citing Dkt. No. 67 at 20-21).

(2) Analysis

The specification contrasts an "underlying interlayer insulating film" with a "buried insulating film" in which "metal wires . . . are buried." '980 Patent at 13:39-47; *see id.* at Fig. 1 (illustrating interlayer insulating film 11 and buried insulating film 13). This distinction is consistent with the common meaning of the prefix "inter." *See* Dkt. No. 67-2, Aug. 26, 2016 Glew Decl. at ¶ 71.

At the October 7, 2016 hearing, Defendants argued that "between" and "within" are not mutually exclusive because layers can extend up through other layers. What Plaintiff's proposed construction precludes, however, is merely an "interlayer insulating film" being mixed together with another layer. Plaintiff's proposal does not appear to preclude the presence of a hole through which the interlayer insulating film might extend.

The Court therefore hereby construes **"interlayer insulating film"** to mean **"an insulating film located between but not within layers."**

O. "small dielectric constant"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"a dielectric constant less than 4.2"	The term "small dielectric constant" is indefinite.

Dkt. No. 59, Ex. A at 14; *id.*, Ex. B at B-7. The parties submit that this term appears in Claims 18 and 35 of the '980 Patent. Dkt. No. 59, Ex. A at 14; *but see id.*, Ex. B at B-7 (Defendants identifying only Claim 18).

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "a dielectric constant less than that of silicon dioxide."

(1) The Parties' Positions

Plaintiff argues that "[t]he term 'small dielectric constant' would have been understood by a POSITA to be synonymous with [the] term 'low-k' as used in the semiconductor industry as of the time of the invention, around 1999-2000," and Plaintiff submits that "low-k" had a well-established meaning in the art at the relevant time. Dkt. No. 67 at 21. Plaintiff also notes that its proposal is consistent with dependent Claims 31 and 48, which require that that the first dielectric film has a dielectric constant of 3.9 or less. *Id.* at 22.

Defendants respond that a "person of skill in the art could not determine the upper boundary of the range of 'small' dielectric constant values, and thus this term, when read in light of the specification and the prosecution history, fails to provide 'objective boundaries for those of skill in the art.'" Dkt. No. 73 at 22 (citation and internal quotation marks omitted). Defendants submit that "the specification is completely silent as to the meaning of the term 'small dielectric constant.'" *Id.* Defendants argue that "Plaintiff's expert provides nothing more than a conclusory statement that 'small dielectric constant' is 'synonymous' with 'low-k,'" and "Plaintiff's leap to the value of 4.2 is completely arbitrary." *Id.* at 23.

Plaintiff replies that the dependent claims provide guidance, and Plaintiff urges that "[t]here can be little dispute that 'small dielectric constant' means 'low-k': a POSITA understands that 'k' refers to 'dielectric constant' and that 'small' is synonymous with 'low.'" Dkt. No. 77 at 7.

At the October 7, 2016 hearing, Plaintiff agreed with the Court's preliminary interpretation that "small dielectric constant" is relative to the dielectric constant of silicon dioxide. Defendants responded that "small" is not defined relative to silicon dioxide because, for example, the specification discloses that silicon dioxide can be used as a material having a "small" dielectric constant. *See* '980 Patent at 7:30-40 & 18:17-27. Plaintiff replied by suggesting that its proposal could be modified to be "a dielectric constant less than *or equal to* 4.2," so as to encompass silicon dioxide.

(2) Analysis

Claim 18 of the '980 Patent, for example, recites (emphasis added):

> 18. A semiconductor device comprising:
> a semiconductor substrate bearing semiconductor elements;
> an interlayer insulating film formed on said semiconductor substrate;
> a metal wire layer including plural metal wires formed on said interlayer insulating film;
> a surface protecting film including a first dielectric film with a *small dielectric constant* for filling at least a part of areas among said metal wires in said metal wire layer and a second dielectric film with a higher moisture absorption preventing function than said first dielectric film for covering said metal wire layer and said first dielectric film, said second dielectric film having a function of suppressing moisture absorption of said first dielectric film;
> an opening for a bonding pad formed in said surface protecting film; and
> a bonding pad formed in said opening for obtaining external electrical connection,
> wherein said bonding pad in said opening and said second dielectric film of said surface protecting film completely cover said first dielectric film so as not to expose said first dielectric film.

Plaintiff has submitted evidence that a similar term of art, "low-k," refers to materials having a dielectric constant less than 4.2, which is the dielectric constant of at least some forms of silicon dioxide. Using silicon dioxide as an insulator is convenient because silicon dioxide layers can be created by oxidizing a surface of a silicon wafer, but superior device performance

can be obtained by using a material with a dielectric constant that is lower than that of silicon dioxide. *See* Dkt. No. 67-2, Aug. 26, 2016 Glew Decl. at ¶¶ 72-76.

The Summary of the Invention refers to the first dielectric film preferably having a dielectric constant of 3.9 or less. '980 Patent at 4:14-23. The specification also discloses using a material with a "small dielectric constant" of 3.5. '980 Patent at 8:9-11. Dependent Claims 31 and 48, however, recite a dielectric constant of 3.9 or less, which implies that the independent claims encompass a dielectric constant greater than 3.9. *See, e.g., Phillips*, 415 F.3d at 1315. Further, Plaintiff has submitted various extrinsic articles regarding "low-k" as referring to a dielectric constant less than 4.2. *See* Dkt. No. 67 at 21-22 (citing *id.*, Exs. L-P).

These disclosures provide sufficient "objective anchor[s]" such that the meaning of the disputed term does not "depend on the unpredictable vagaries of any one person's opinion." *See Datamize*, 417 F.3d at 1350. The Court therefore hereby expressly rejects Defendants' indefiniteness argument.

As to the proper construction, the parties have a factual dispute as to whether the dielectric constant of silicon dioxide is 4.2 or, for example, 3.9. *See, e.g.,* Dkt. No. 73-13, Sept. 9, 2016 Gwozdz Decl. at ¶¶ 66-76 ("the standard silicon dioxide CVD dielectric layer for IC interconnect can have a range of values, about 3.9 to 5.0"); Dkt. No. 77-2, Sept. 16, 2016 Glew Decl. at ¶¶ 19-35 *esp.* at ¶ 25-35 ("the evidence relied upon by Dr. Gwozdz [(Defendants' expert)] does not support his conclusion"). What is clear, however, is that the term "small dielectric constant" in the context of the '980 Patent refers to a dielectric constant not greater than that of silicon dioxide. *See, e.g.,* '980 Patent at 7:30-40 & 18:17-27.

The Court therefore hereby construes **"small dielectric constant"** to mean **"a dielectric constant not greater than that of silicon dioxide."**

P. "said bonding pad in said opening and said second dielectric film of said surface protecting film completely cover said first dielectric film so as not to expose said first dielectric film"

Plaintiff's Proposed Construction	Defendants' Proposed Construction
"the bonding pad and the second dielectric film collectively cover the first dielectric film so that it is not exposed to above"	"the bonding pad in the opening and the second dielectric film each covers a portion of the first dielectric film so that it is not exposed"

Dkt. No. 59, Ex. A at 17; *id.*, Ex. B at B-8. The parties submit that this term appears in Claim 18 of the '980 Patent. Dkt. No. 59, Ex. A at 17; *id.*, Ex. B at B-8.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "the bonding pad and the second dielectric film collectively cover the first dielectric film so that it is not exposed to above."

(1) The Parties' Positions

Plaintiff argues that "[t]he claim language uses the plural verb 'cover,' indicating that the bonding pad and second dielectric film taken together cover the first dielectric film." Dkt. No. 67 at 23.

Defendants respond that "the plain and ordinary meaning of 'completely cover' does not mean to cover only from above." Dkt. No. 73 at 24. Defendants also argue that "Plaintiff's use of the term 'collectively'—which is found nowhere in the specification—is an attempt to rewrite the term '*and'* to mean *either* the bonding pad covers the first dielectric film by itself, *or* the second dielectric film covers the first dielectric film by itself, or both." *Id.* at 25.

Plaintiff replies that "Defendants' proposal should be rejected because it would exclude the embodiment shown in Figure 14, a point that Defendants have not even attempted to address." Dkt. No. 77 at 8. Plaintiff also submits that "[i]n no embodiments do the bonding

pad 15 and second dielectric film 14 cover all surfaces of the first dielectric film 13." *Id.* (citing '980 Patent at Figs. 1-17).

At the October 7, 2016 hearing, Defendants argued that something is not "completely" covered if its sides are exposed. Plaintiff responded that whereas the disputed term relates to covering the top, other structures may cover the sides. As to Plaintiff's proposal of "collectively," Defendants argued that Plaintiff is attempting to re-write "and" to mean "or."

(2) Analysis

Claim 18 of the '980 Patent, for example, recites (emphasis added):

> 18. A semiconductor device comprising:
> a semiconductor substrate bearing semiconductor elements;
> an interlayer insulating film formed on said semiconductor substrate;
> a metal wire layer including plural metal wires formed on said interlayer insulating film;
> a surface protecting film including a first dielectric film with a small dielectric constant for filling at least a part of areas among said metal wires in said metal wire layer and a second dielectric film with a higher moisture absorption preventing function than said first dielectric film for covering said metal wire layer and said first dielectric film, said second dielectric film having a function of suppressing moisture absorption of said first dielectric film;
> an opening for a bonding pad formed in said surface protecting film; and
> a bonding pad formed in said opening for obtaining external electrical connection,
> wherein *said bonding pad in said opening and said second dielectric film of said surface protecting film completely cover said first dielectric film so as not to expose said first dielectric film*.

On balance, the better reading of the plain language of the claim is that the bonding pad and the second dielectric film, together, must completely cover the first dielectric film. Further, to whatever extent Defendants are arguing that the bonding pad and second dielectric film must completely surround the first dielectric film—above, below, and on all sides—no such limitation is apparent. Instead, the context of the claim, as set forth above, demonstrates that "cover" refers to covering a surface of the dielectric film that faces away from the semiconductor substrate.

These findings are consistent with Plaintiff's proposal of "not exposed to above" and with the specification, which discloses that "since the first dielectric film within the opening is covered with the bonding pad and the second dielectric film so as not to expose the first dielectric film, the moisture absorption through the opening can be prevented." '980 Patent at 3:3-7.

Defendants have cited Figure 5, arguing that "while the second dielectric film (14) covers the top of the first dielectric film (13), the bonding pad (15) covers the sides of the first dielectric film (13)." Dkt. No. 73 at 26. Even assuming for the sake of argument that Defendants' interpretation of Figure 5 is correct, Defendants have not demonstrated why this illustration demands that the word "cover" should be interpreted to requiring surrounding on all sides.

The Court therefore hereby construes **"said bonding pad in said opening and said second dielectric film of said surface protecting film completely cover said first dielectric film so as not to expose said first dielectric film"** to mean **"the bonding pad and the second dielectric film each covers a portion of the first dielectric film, and the bonding pad and the second dielectric film collectively cover the first dielectric film so that it is not exposed to above."**

Q. "wherein said bonding pad covers said opening"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
"wherein said bonding pad extends across said opening"	"said bonding pad extends across said opening from one end to the other, whether within, above, or below"

Dkt. No. 59, Ex. A at 18; *id.*, Ex. B at B-9. The parties submit that this term appears in Claim 35 of the '980 Patent. Dkt. No. 59, Ex. A at 18; *id.*, Ex. B at B-9.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "Plain and ordinary meaning."

At the October 7, 2016 hearing, both sides accepted the Court's preliminary construction.

The Court therefore hereby construes **"wherein said bonding pad covers said opening"** to have its **plain meaning**.

IX. DISPUTED TERMS IN U.S. PATENT NO. RE43,729

The '729 Patent, titled "Processor Which Can Favorably Execute a Rounding Process Composed of Positive Conversion and Saturated Calculation Processing," issued on October 9, 2012, and bears an earliest priority date of December 1, 1997.

R. "performed within one cycle"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term is definite and does not need construction and can be understood under its plain and ordinary meaning. To the extent a construction is necessary: "performed within one clock cycle"	The term "performed within one clock cycle" is indefinite. To the extent the term can be construed: the stated operations are started and completed entirely in a single pipeline stage.

Dkt. No. 59, Ex. A at 30; *id.*, Ex. B at B-24. The parties submit that this term appears in Claim 21 of the '729 Patent. Dkt. No. 59, Ex. A at 30; *id.*, Ex. B at B-24.

Shortly before the start of the October 7, 2016 hearing, the Court provided the parties with the following preliminary construction: "performed within one clock cycle."

(1) The Parties' Positions

Plaintiff argues that "the term 'cycle' is one of the most fundamental and basic terms of art, and is universally understood in the art as a measure of time and as a 'clock cycle.'" Dkt. No. 67 at 25. Plaintiff also argues that Defendants' alternative proposal is inconsistent with the specification as well as the prosecution history. *Id.* at 26-28.

Defendants respond that execution time can vary such that the horizontal intervals in Figures 12(a) and 12(b), for example, need not necessarily execute within one clock cycle. Dkt.

No. 73 at 27-28. Nonetheless, Defendants argue that "[d]espite this material disagreement, both constructions are equally plausible interpretations of these Figures, and that conclusion means that the Court must find this claim term to be indefinite." *Id.* at 28.

Plaintiff replies that "the fact that the specification uses the term 'stage' provides no support for replacing the well-understood term 'cycle' with 'stage.'" Dkt. No. 77 at 9. Plaintiff also argues that "the replacement of 'performed within' with 'started and completed entirely in,' as proposed by Defendants, is unnecessary because it will not aid the jury's understanding." *Id.* at 10.

At the October 7, 2016 hearing, Defendants argued that although Plaintiff's interpretation may be plausible, the presence of an alternative plausible interpretation renders the term indefinite. Plaintiff responded that the alternative interpretation proposed by Defendants is not plausible.

(2) Analysis

Defendants have not demonstrated that the existence of two potential interpretations of "performed within one cycle" necessarily renders the claim indefinite. As to the proper construction, Plaintiff has submitted both intrinsic and extrinsic evidence.

Plaintiff has submitted extrinsic technical dictionaries that define "cycle" as a computer processor clock cycle. *See* Dkt. No. 67, Ex. Q, *Microsoft Press Computer Dictionary* 99 (2d ed. 1994) ("CPU cycle" is "[a]lso called a clock tick"); *see also id.*, Ex. R, *Dictionary of Computer and Internet Terms* 114 (6th ed. 1998) (defining "cycle" as "one oscillation of a computer's CPU CLOCK; the shortest step into which computer actions can be divided"); *id.*, Ex. S, *Dictionary of Computer Science, Engineering, and Technology* 115 (2001) at 4 ("cycle": "*See* clock cycle").

The opinion of Plaintiff's expert is also persuasive in this regard. *See* Dkt. No. 67-3, Aug. 26, 2016 Conte Decl. at ¶¶ 29-30.

Also, during prosecution of parent United States Patent No. RE43,145, the patentee explained that "[t]o one of skill in the art, it would have been understood that each interval in the horizontal direction in FIGS. 12A and 12B represents one cycle." Dkt. No. 67, Ex. U, June 16, 2009 Amendment at 20; *see id.*, Nov. 3, 2009 Supplemental Amendment at 20-21 (same); *see also id.*, Apr. 23, 2010 Interview Summary at 2-3; *id.*, May 10, 2010 Amendment at 20-22; *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1349 (Fed. Cir. 2004) ("the prosecution history of one patent is relevant to an understanding of the scope of a common term in a second patent stemming from the same parent application").

Further, Figures 12A and 12B resemble timing diagrams known in the art, in which each horizontal interval represents one clock cycle. *See* Dkt. No. 67, Ex. T, Mohamed Rafiquzzaman, *Microprocessors and Microcomputer-Based System Design* 498-99, Fig. 7.29 (2d ed. 1995); *see also id.*, Aug. 26, 2016 Conte Decl. at ¶¶ 37-43. In light of the patentee's above-noted explanation that each horizontal interval in Figures 12A and 12B represents one "cycle," this extrinsic evidence reinforces that a person of ordinary skill in the art would understand that the patentee used the term "cycle" to refer to one clock cycle.

Finally, one of the references cited by the '729 Patent is United States Patent No. 5,917,740, which uses the terms "clock" and "clock cycle" interchangeably. *See* Dkt. No. 77-3, Sept. 16, 2016 Conte Decl., Ex. 1, U.S. Pat. No. 5,917,740 at 4:47-55 (when discussing "pipeline" with "nine stages," stating that "the latency (time from start to end of execution) of most instructions is nine clock cycles," and noting that "some instructions may require more than one cycle to execute due to the nature of the instruction"); *see also V-Formation, Inc. v. Benetton*

Group SpA, 401 F.3d 1307 (Fed. Cir. 2005) ("prior art cited in a patent or cited in the prosecution history of the patent constitutes intrinsic evidence") (citations and internal quotation marks omitted).

Defendants have cited disclosure regarding pipeline stages, but nothing in those disclosures is inconsistent with finding that the term "one cycle" refers to one clock cycle. *See* '729 Patent at 11:8-28 & 19:50-20:6. Plaintiff's expert has persuasively opined that interpreting "cycle" as "pipeline stage," as Defendants have proposed, would lead to the nonsensical result that both the rows and columns of Figures 12A and 12B would represent pipeline stages. *See* Dkt. No. 67-3, Aug. 26, 2016 Conte Decl. ¶¶ 42-44. Of note as well, the Patent Trial and Appeal Board ("PTAB") of the United States Patent and Trademark Office recently rejected a proposal that the recital of "one cycle" means "performed within a single processor stage. Dkt. No. 86, Ex. A, Sept. 29, 2016 Decision at 8. The PTAB "construe[d] the term 'one cycle' to encompass one oscillation of a CPU clock . . . ." *Id.* at 10.

As to Plaintiff's proposal of "performed," the parties do not appear to have any substantive dispute that "performed" requires completion, so no construction of "performed" is necessary.

The Court therefore hereby construes **"performed within one cycle"** to mean **"performed within one clock cycle."**

S. "predetermined instruction"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term is definite and does not need construction and can be understood under its plain and ordinary meaning. To the extent a construction is necessary: "instruction determined in advance"	The term "predetermined instruction" is indefinite

Dkt. No. 59, Ex. A at 32-33; *id.*, Ex. B at B-25-26. The parties submit that this term appears in Claim 21 of the '729 Patent. Dkt. No. 59, Ex. A at 32-33; *id.*, Ex. B at B-25-26.

In their September 23, 2016 Joint Claim Construction Chart, the parties submit an agreement that this term means "instruction determined in advance." Dkt. No. 80, Ex. A at 20. The Court therefore sets forth the parties' agreement in Appendix A to the present Claim Construction Memorandum and Order.

T. "detecting / detecting unit"

Plaintiff's Proposed Construction	**Defendants' Proposed Construction**
This term does not need construction and can be understood under its plain and ordinary meaning. To the extent a construction is necessary: "identifying an instruction for processing" / "unit for identifying an instruction for processing"	"a circuit that determines which instruction will be processed by evaluating the bit pattern that identifies a particular instruction"

Dkt. No. 59, Ex. A at 34; *id.*, Ex. B at B-26; Dkt. No. 67 at 29. The parties submit that this term appears in Claim 21 of the '729 Patent. Dkt. No. 59, Ex. A at 34; *id.*, Ex. B at B-26.

In their September 23, 2016 Joint Claim Construction Chart, the parties submit an agreement that "[t]his term does not need construction and can be understood under its plain and ordinary meaning." Dkt. No. 80, Ex. A at 20. The Court therefore sets forth the parties' agreement in Appendix A to the present Claim Construction Memorandum and Order.

X. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit.

The parties are ordered to not refer to each other's claim construction positions in the presence of the jury. Likewise, in the presence of the jury, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court. The Court's reasoning in this order binds the testimony of any witnesses, and any reference to the claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 9th day of November, 2016.

ROY S. PAYNE
UNITED STATES MAGISTRATE JUDGE

APPENDIX A

U.S. Patent No. 6,197,696	
Term	Parties' Agreement
Claim 13	The parties agree that all steps a) – k) in claim 13 must be performed in the order listed.
U.S. Patent No. 6,538,324	
Term	Parties' Agreement
"said first film containing nitrogen in a smaller content than that of said second film" (Claims 1, 5)	"the first film's concentration of nitrogen is less than the second film's concentration of nitrogen"
U.S. Patent No. 7,126,174	
Term	Parties' Agreement
"L-shaped sidewalls" (Claims 1, 14)	"sidewalls that substantially resemble a capital letter 'L' or its mirror image"
"first silicide layers formed on regions located on the sides of the first L-shaped sidewalls within the active area" (Claim 1)	"first silicide layers formed on regions that are within the active area and located on the sides of the first L-shaped sidewalls"
"surface of the active area" (Claims 9, 10)	"top of the active area"
"a lower portion of the interconnection provided on the upper surface of the trench isolation is located higher than the surface of the active area" (Claim 10)	"a bottom surface of the interconnection provided on the upper surface of the trench isolation is located higher than the surface of the active area"
"composed of the same material" (Claim 11)	Plain and ordinary meaning
"made of the same insulating film" (Claim 14)	"made of the same insulating material"

U.S. Patent No. 8,354,726	
Term	Parties' Agreement
"having an L-shaped cross section" (Claim 1)	"having a cross-section that substantially resembles a capital letter 'L' or its mirror image"
"the distance between the first gate electrode and the auxiliary pattern is smaller than the sum total of: the sum of the thicknesses of the first and second side-wall insulating films; and the double of the thickness of the stress-containing insulating film" (Claim 1)	"the distance between the two closest points of the first gate electrode and the auxiliary pattern is smaller than the sum total of: the sum of the thicknesses of the bases of the first and second side-wall insulating films; and the double of the thickness of the stress-containing insulating film"
"a minimum distance between the first side-wall insulating film and the second side-wall insulating film is less than twice a thickness of a part of the stress-containing insulating film on the first gate electrode, the distance being formed between the first gate electrode and the auxiliary pattern" (Claim 28)	"a distance between the two closest points of the first side-wall insulating film and the second side-wall insulating film is less than twice a thickness of a part of the stress-containing insulating film on the first gate electrode, the distance being formed along a line between the first gate electrode and the auxiliary pattern"
"the distance between the first gate electrode and the second gate electrode is smaller than the sum total of: the sum of the thicknesses of the first and second side-wall insulating films; and the double of the thickness of the silicon nitride film" (Claim 43)	"the distance between the two closest points of the first gate electrode and the second gate electrode is smaller than the sum total of: the sum of the thicknesses of the bases of the first and second side-wall insulating films; and the double of the thickness of the silicon nitride film"

"the side surfaces of the first and second gate electrodes are shifted in the gate length direction with each other, a shift distance of the second gate electrode with respect to the first gate electrode is 0 μm or more and less than a predetermined value, the predetermined value is a sum of: a sum of a gate length of the first gate electrode and a total thickness of the first side-wall insulating film and a part of the silicon nitride film formed on the side surface of the first gate electrode; and a total thickness of the second side-wall insulating film and a part of the silicon nitride film formed on the side surface of the second gate electrode" (Claim 43)	"the side surfaces of the first and second gate electrodes are shifted in the gate length direction with each other, a distance the side surface of the second gate electrode is shifted with respect to the side surface of the first gate electrode is 0 μm or more and less than a predetermined value, the predetermined value is a sum of: a sum of a gate length of the first gate electrode and a total thickness of the based [*sic*] of the first side-wall insulating film and a part of the silicon nitride film formed on the side surface of the first gate electrode; and a total thickness of the base of the second side-wall insulating film and a part of the silicon nitride film formed on the side surface of the second gate electrode"
"a minimum distance between the first side-wall insulating film and the second side-wall insulating film is less than twice a thickness of a part of the silicon nitride film on the first gate electrode, the distance being formed between the first gate electrode and the second gate electrode" (Claim 61)	"a distance between the closest points of the first side-wall insulating film and the second side-wall insulating film is less than twice a thickness of a part of the silicon nitride film on the first gate electrode, the distance being formed along a line between the first gate electrode and the second gate electrode"
"auxiliary pattern" (Claims 1, 4, 8-10, 17-24, 26-28)	"another distinct pattern"
U.S. Patent No. RE41,980	
Term	Parties' Agreement
"a metal wire layer including plural metal wires formed on said interlayer insulating film" (Claims 18, 35)	"a metal wire layer including more than one metal wire formed above said interlayer insulating film"

"wherein said first dielectric film is made from at least one oxide film selected from the group consisting of a silicon oxide film, a silicon oxide film doped with fluorine and a porous silicon oxide film, or a composite film including an organic insulating film and at least one oxide film selected from the group consisting of a silicon oxide film, a silicon oxide film doped with fluorine and a porous silicon oxide film" (Claims 30, 47)	"wherein said first dielectric film is made from a silicon oxide film, a silicon oxide film doped with fluorine, a porous silicon oxide film, a composite film including any of these silicon oxide films, or a composite film including any of these silicon oxide film and an organic insulating film"
U.S. Patent No. RE43,729	
Term	Parties' Agreement
"predetermined instruction" (Claim 21)	"instruction determined in advance"
"detecting / detecting unit" (Claim 21)	This term does not need construction and can be understood under its plain and ordinary meaning.

Dkt. No. 59 at 2-5; Dkt. No. 80, Ex. A at 1-6, 8-9, 14-15, 18 & 20.